

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Application of )

PUBLIC UTILITIES COMMISSION )

Instituting a Proceeding to Investigate the )  
Implementation of Feed-in Tariffs. )  
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DOCKET NO. 2008-0273

**THE SOLAR ALLIANCE'S AND HAWAII SOLAR ENERGY ASSOCIATION'S  
FINAL STATEMENT OF POSITION REGARDING FEED-IN TARIFF DESIGNS,  
POLICIES AND SPECIFIC PRICING PROPOSALS**

**AND**

**CERTIFICATE OF SERVICE**

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PUBLIC UTILITIES  
COMMISSION

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RILEY SAITO  
73-1294 Awakea Street  
Kailua-Kona, HI 96740  
Telephone No.: (808) 895-0646

for The SOLAR ALLIANCE

MARK DUDA  
HAWAII SOLAR ENERGY ASSOCIATION  
PRESIDENT  
PO Box 37070  
Honolulu, HI 96837  
Telephone No.: (808) 735-1467

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POLICIES AND SPECIFIC PRICING PROPOSALS**

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF HAWAII:

Pursuant to the Hawaii Public Utilities Commission's (the "Commission") Order Approving the HECO Companies' Proposed Procedural Order, as Modified, The Solar Alliance ("SA") and Hawaii Solar Energy Association ("HSEA") (herein after jointly referred to as "SA/HSEA") hereby submits to the Commission its Final Statement of Position Regarding Feed-in Tariff Designs, Policies and Specific Pricing Proposals.

***1. Highlights of SA/HSEA's positions articulated in its Opening Statement of Position.***

On February 25, 2009, also pursuant to the Commission's Order, SA/HSEA filed their Opening Statement of Positions and Appendix "A": Proposal for Feed-in Tariff Design, Policies, and Pricing Methods. The Proposal, which was a collaborative effort between some of the intervenor parties, identified SA/HSEA's position and proposals regarding key policy and

design elements of a FiT which can serve as a basis for developing tariff sheets following any Commission decision in this proceeding.<sup>1</sup>

In their Opening Statement of Positions, SA/ HSEA specifically proposed the following:

(i) That changes be made to the HECO Companies' Rule 14; (ii) Specific FiT rates for PV generators; (iii) that the generation limits for all technologies be increased to 20MW; (iv) That the term of the FiT contracts be 20 years; (v) The retention of the net metering program for both existing and future eligible customers; (vi) That "Photovoltaic Generating Facility" be defined as "a Renewable Energy Generating Facility that generates electricity from Solar Radiation."; (v) That the penetration limit for PV generators be 50%.

*(i) SA/HSEA proposes that changes should be made to HECO Companies' Rule 14 in order to encourage more renewable generators, as envisioned in the October 2008 Energy Agreement between the HECO Companies and the State (hereafter "the Energy Agreement"):* As stated in SA/HSEA's Opening Statement of Positions, several sections of Rule 14 has proven to be problematic.

One such area of concern is *Rule 14, Appendix I, Section 2. General Interconnection Guidelines d. Utility Feeder Penetration*. This section introduces a ten percent feeder penetration limit. A limit at this level is at odds with the proposal in the Energy Agreement which indicates that distribution level circuit penetration be capped at 15%. The specific language of the Agreement is as follows:

- Distributed generation interconnection will be limited on a per-circuit basis, where generation (including PV, micro wind, internal combustion engines, and net metered generation) feeding into the circuit shall be limited to no more than **15% of peak circuit demand for all distribution-level circuits of 12kV or lower;**<sup>2</sup>

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<sup>1</sup> Where SA/HSEA took exception to the collaborative document was highlighted in their Appendices "A".

<sup>2</sup> See Section 19 at p. 28 (emphasis added).



SA/HSEA does not necessarily agree that 15% should serve as an upper limit on per-circuit distributed generation. However, SA/HSEA believe that the fact that the HECO Companies agreed to this level indicates that such levels will not engender reliability or stability problems, and would therefore constitute a reasonable place to begin.

SA/HSEA would like to emphasize that the proposal here, as derived from the Energy Agreement, is for 15% of peak circuit demand of all distribution level circuits of 12 kV or lower. In the HECO Companies' activities, "distribution level circuits" have not always been defined as being equivalent to "feeder distribution" for purposes of determining the need for an IRS. For this purpose, at least HELCO has defined "utility feeder" as the line running from the substation to a set of customers.

This more restrictive definition may or may not be different from the Commission's intention where it defines "feeder penetration" in Rule 14, Appendix I, Section 2, General Interconnection Guidelines, (d) Utility Feeder Guidelines. In any case, SA/HSEA note that there is no publically available information regarding the configuration of circuits or "feeder circuits," however defined, and that this makes it impossible to know the penetration of a given feeder in advance of the proposal for a specific project. This lack of transparency has substantial marketplace impacts as the time frame to complete an IRS is unknown and can not only delay completion but shift placed-in-service dates into subsequent tax years, which undermines project funding given the tax incentive support for PV projects.

SA/HSEA's second concern with Rule 14 deals with *Section 3 Design Requirements, f. Supervisory control*. This section states that the utility may require computerized remote control for any generating facilities with an aggregate capacity of more than 1MW. This requirement creates a *de facto* system size limit that investors may not be willing to exceed, due to fears of incurring unknown levels of additional cost, study requirements, and/or remote curtailment.

Each of these factors has the ability to substantially alter the financial performance of an investment in renewable energy and the lack of clarity on these issues will serve as a disincentive to investment in projects over 1 MW, irrespective of factors such as customer load and availability of investment funds that ought to determine system sizes.

***(ii) SA/HSEA proposed specific FiT rates for eligible PV generators.*** These rates are proposed based on the premise that, in order for a feed-in tariff to be a meaningful mechanism for accelerating the state toward attainment of its clean energy goals, it must offer investors a risk-adjusted rate of return sufficient to induce them to invest in PV projects in the State of Hawaii. This premise is based on SA/HSEA's knowledge of attempts to introduce feed-in tariffs in other jurisdictions, which revealed that a feed-in tariff's ability to induce investment in a specific type of renewable energy project is subject to threshold effects wherein below the requisite threshold price investment levels will be zero, and once the threshold price is reached investment will commence.

In this context, SA/HSEA believe that the best currently available evidence for what this price threshold is for PV in Hawaii comes from ten projects on three islands that were developed at the end of 2008 and funded using only federal tax credits. (SA/HSEA ignored the Hawaii Renewable Energy Technologies Income Tax Credit because it is the fact that this credit cannot be utilized by investors that drives the need for a feed-in tariff at all.) The left panel of Table 1, below, presents pricing from these projects, in which the State of Hawaii agreed to buy power under a 20 year power purchase arrangement with an investment group.



Executed Third Party Financed PV Projects (No State Tax Credit)					Proposed FiT Rates - NO escalation over 20 years					
Location	PV System Size	Baseline rate \$/kWh	Annual Escalation	Average Rate over 20 years	System Size kWh	Oahu	Mau	Molokai	Lanai	Hawaii
Kauai- Aripport	154	0.38	2%	0.4617	100 to 500	\$ 0.396	\$ 0.436	\$ 0.475	\$ 0.475	\$ 0.444
Kauai- Aripport	112	0.38	2%	0.4617	100 to 500	\$ 0.396	\$ 0.436	\$ 0.475	\$ 0.475	\$ 0.444
Kauai- Aripport	35	0.38	2%	0.4617	11 to 100	\$ 0.436	\$ 0.479	\$ 0.523	\$ 0.523	\$ 0.488
Kauai- Aripport	35	0.38	2%	0.4617	11 to 100	\$ 0.436	\$ 0.479	\$ 0.523	\$ 0.523	\$ 0.488
Kauai- Highways	98	0.38	2%	0.4617	11 to 100	\$ 0.436	\$ 0.479	\$ 0.523	\$ 0.523	\$ 0.488
Kauai - Harbors	30	0.38	2%	0.4617	11 to 100	\$ 0.436	\$ 0.479	\$ 0.523	\$ 0.523	\$ 0.488
Hilo Airport	112	0.33	3%	0.4434	100 to 500	\$ 0.396	\$ 0.436	\$ 0.475	\$ 0.475	\$ 0.444
Kona Airport	60	0.32	3%	0.4299	11 to 100	\$ 0.436	\$ 0.479	\$ 0.523	\$ 0.523	\$ 0.488
Kahului - Airport	112	0.32	3%	0.4299	100 to 500	\$ 0.396	\$ 0.436	\$ 0.475	\$ 0.475	\$ 0.444
Kahului - Airport	31	0.32	3%	0.4299	11 to 100	\$ 0.436	\$ 0.479	\$ 0.523	\$ 0.523	\$ 0.488

SA/HSEA's proposed FiT rates are derived from these rates by levelizing them over a 20 twenty year period to conform with standard FiT design in which FiT rates do not include any escalation. (The third party financed rates start lower and escalate over the life of the agreement.) These levelized rates are then adjusted upwards or downwards depending on system size (higher systems lead to lower costs due to economies of scale in installation and materials acquisition) and island (Neighbor Island installation costs exceed those on Oahu by varying amounts). The mechanics of these adjustments were covered in detail in SA's response to HECO/Solar Alliance-IR-21.

In order to provide some degree of comparison, Table 1 presents the "Average Rate over 20 years" column, which is a simple arithmetic average of the annual prices the State will pay over the 20 year contract term. The panel on the right lists SA/HSEA's proposed FiT rates by island for systems in the same size classes. Comparing the left and right panels of Table 1 indicates that SA/HSEA's FiT rates are at or below the prices on third party financed contracts that the State of Hawaii has signed recently.

In summary, the SA/HSEA rates are specifically crafted so that they exhibit a highly favorable property of any feed-in tariff rate that is intended to accelerate the penetration of

renewables on Hawaii's electric utility grids. That is, they are based on actual recent market intelligence as to the specific prices that investors need to receive in order to deploy capital to support investments in PV projects in Hawaii.

***(iii) In order to meet the penetration goals of HCEI the generation limits of the FiT must be applied to larger resources:*** SA/HSEA proposed that PV generators up to 20MW be eligible for FiTs. Allowing larger resources to be eligible for FiTs eliminates price and award uncertainty and the laborious and long timelines of a competitive bidding process and/or a bilateral negotiated power purchase agreement ("PPA"). Relative to a competitive bidding process and/or a bilateral negotiated PPA, FiTs will draw more PV developers into the market by providing them with a set price and a shortened process, while the uncertainty and time requirements for competitive bidding and/or a bilateral negotiated PPA raises the cost for a developer and, thus discourages developers and/or causes them to raise their rates.

***(iv) Net metering should be retained both for existing and future eligible customers:*** SA/ HSEA note that net energy metering ("NEM") and feed-in tariff are not mutually exclusive and that the interests of prospective customer-generators are best served by giving them the option of choosing between the two.

This is the case because the situation of a customer generator under a feed-in tariff differs from that of a customer-generator under NEM. This difference can be understood most simply by noting that under current rules, net-metered customer-generators are incapable of entering the energy production *business* because they cannot be compensated for annual aggregate production in excess of annual aggregate usage. This clarifies that NEM is a mechanism for the customer generator to manage the operating costs of his/her home or business but precludes him/her from deriving any additional financial benefits. In contrast, a customer-generator under a feed-in tariff



has the option of investing in generating equipment at whatever level his/her financial resources and physical site can accommodate and entering the energy production business.

This distinction can be seen by considering three examples. In the first, imagine the case of a business inhabiting a large warehouse with minimal load. Under the current system, the owner has the option of either (a) installing a net-metered PV system on a small portion of his/her roof in order to eliminate the site's load or else (b) submitting an unsolicited proposal to the utility to buy power produced from a larger system installed on the entire roof. (The fact that this latter process has, historically, been time consuming and fraught with uncertainty due to lack of urgency and transparency on behalf of the utility has discouraged virtually all such would-be IPPs and is one of the motivations for the feed-in tariff docket itself.) Under a feed-in tariff, the warehouse owner could install a large PV system and be assured of the ability to interconnect and receive a known price for the energy produced by the system. That is, under a regulatory regime where both NEM and feed-in tariff options are available, the warehouse owner is able to make an informed choice about whether to enter the energy production business (by choosing feed-in tariff) or whether to simply offset load (by choosing NEM). The likely choice will be feed-in tariff, contingent, only on the owner's ability to raise funds, procure legal control of the roof, and related factors.

Now consider a business with the same size load as the warehouse in a facility that can just accommodate enough PV panels to generate the power to offset its annual load. The business owner can again choose between a feed-in tariff and NEM contract. If the FiT rate does not exceed the retail rate, the choice is obvious, the owner will choose NEM. If the FiT rate does exceed the retail rate, it will still likely be in the customer-generator's interest to choose NEM because of the uncertainty and probable upward trajectory of grid power prices. That is, in this case the customer-generator with the option of NEM and FiT will choose to manage operating



costs via NEM rather than to incur the risks associated with not knowing the future price of one of its most significant operating expenses. Forcing this customer onto an FiT contract severely erodes the value of the hedge against future operating costs increases that motivates, in whole or in part, the investment in renewable energy made by many customer-generators under NEM.

Finally, consider a business housed in a warehouse the same size as the first, but with a much greater load. The load in fact at this facility is higher by enough of a margin that it cannot be met by covering the entire roof with PV. In this case, though the system will be large, the customer-generator would still in most cases prefer NEM over FiT because it goes farthest toward managing uncertainty in the entity's core business. Becoming an energy producer in pursuit of profit is secondary to this goal.

These examples, while stylized, illustrate the differing appeal of NEM and FiT compensation mechanisms for customer-generators under different load/site combinations. As such, they argue for the perpetuation of NEM alongside and future FiT regime in order to provide the appropriate incentive for variously situated businesses to invest in renewable energy, thereby accelerating the state's pursuit of clean energy and energy independence.

The argument for allowing homeowners access to NEM in the future is even more straightforward. Few homeowners invest in PV in order to enter the energy production business. Rather they seek to reduce and stabilize the cost of operating their home in Hawaii's high electricity cost environment. Denying them access to NEM will not serve the interests of the majority of homeowners and will also set up future problems, as has recently become the case in Germany, where officials are now seeking ways to move FiT customers to NEM contracts as grid power prices have moved above FiT rates and many are unable to pay their power bills.<sup>3</sup>

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<sup>3</sup> See, [http://www.erneuerbare-nergien.de/files/pdfs/allgemein/application/pdf/eeg\\_2009\\_en.pdf](http://www.erneuerbare-nergien.de/files/pdfs/allgemein/application/pdf/eeg_2009_en.pdf) at Section 33 on p. 10

Based on the comments above, it is obvious that SA/HSEA is also advocating that customer-generators with existing NEM contracts not have those contracts unilaterally terminated. The fact that this should not happen, while not clearly expressed in the Energy Agreement, has been publically advocated by representatives of the HECO Companies in various public forums since the announcement of the Agreement.

Please also note that SA/HSEA's position in favor of maintaining NEM alongside FiT, is consistent with Exhibit A of the Energy Agreement which allows for the continuation of the net metering program in Hawaii both for existing and future eligible customer-generators.

In summary, NEM has a proven track record in Hawaii, with penetration levels growing exponentially since its introduction in 2001. In order to meet the state's renewable energy goals NEM should be permitted to continue as NEM + FiT will induce more entities to install more renewable energy generating capacity than under either NEM or FiT alone.

***(v) "Photovoltaic Generating Facility" should be defined as "a Renewable Energy Generating Facility that generates electricity from Solar Radiation."*** This definition encompasses all PV generators, including those that concentrate the sun's energy on photovoltaic materials. (PV concentrating technology is not the same as "CSP" technologies.)

***(vi) The penetration limits for PV should be 50%:*** As detailed in SA/HSEA's Appendix "A": Proposal for Feed-in Tariff Design, Policies, and Pricing Methods, attached to its Opening Statement of Position, SA/HSEA in the spirit of collaboration has proposed that the HECO Companies are not obligated to interconnect a PV generating facility to its electric system and to offer it a FiT Agreement to purchase and pay for its renewable PV energy at a FiT rate if the PV facility is placed in service after December 31 of the year following the year during which the

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aggregate electrical capacity that are PV facilities or CSP facilities as to which technical requirements for interconnection have been met equals or exceeds 50 percent of the peak demand for such electrical system, provided that the Commission may increase such penetration limit. SA/HSEA, however, believes to set the penetration limit any lower than 50 percent would deter the development and integration of PV renewable energy in the State and would be contrary to the goals set out in the HCEI.

***2. SA and HSEA maintain its positions articulated in its Opening Statement of Position and Proposes additional Proposals.***

SA/HSEA maintains its position as detailed in its Opening Statement of Position and Appendix A, but would also propose that this FiT investigation: (i) recognize that PV has a positive impact on the utility's system's grid; (ii) find that FiTs will not result in increased rates to the ratepayer in the long run; (iii) find that the HECO Companies must proactively seek to upgrade their grids with the goal of accommodating more renewable energy

***(i) PV generated renewable energy has been proven to have a positive impact on the utility's system's grid,*** thus allowing PV generators to be eligible for FiT as proposed by SA/HSEA will not have a negative impact on the HECO Companies reliability and/or power quality. Numerous Hawaii studies have concluded that PV invertors positively contribute to the feeder voltage regulation and result in an improved voltage profile. Studies conducted elsewhere indicate that at higher penetration levels, PV invertors actually provide feeder voltage support.<sup>4</sup>

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<sup>4</sup> See, Distribution System Voltage Performance Analysis for High-Penetration Photovoltaics, NREL/SR-581-42298, February 2008; HECO's Ramp Rate Performance Standard for Intermittent Generation on the HECO System, March 14, 2008 at 8-10; Big Island Energy Road Map – Status, Terry Surles, Hawaii Natural Energy Institute, October 17, 2007; and Technology Issues in Renewable Energy and Energy Efficiency, presented to the Hawaii State Legislature by Richard Rocheleau, Hawaii Natural Energy Institute, January 22, 2009.

***(ii) FiTs will not result in increased rates to the ratepayers in the long run:*** The utility ratepayers may experience a rate increase in the short-run, but over the course of 20 year FIT contracts utility ratepayers will experience: (i) stable and set rates; (ii) a decrease in rates, especially if the price of oil keeps rising in the next 20 years; and (iii) economic growth more generally because the use of PV will create a vigorous renewable energy industry in the state; because business owners will have more capital to invest in revenue generating activities in the state; and because reducing the amount of money exported from the state to purchase fossil fuels will leave more to circulate locally.

The chart on the next page indicates how the FIT rates proposed match up to retail cost of energy based on "business as usual" (i.e., continued historical rates of grid power price escalation) by the utility. (It is appropriate to compare the proposed FiT rates to the projected retail rate for the purpose of ascertaining rate payer impacts because PV systems, as distributed sources of energy, send exported electrons to the nearest source of load on the system. The cost differential to the receiving customer is therefore the difference between the retail and FiT rates.)



Utility	Rate Class	Year the Fit energy cost falls below the utility cost	Number of years that FiT Energy cost falls below the utility cost
<b>HECO</b>	<b>Residntl</b>	<b>2020</b>	<b>10</b>
	<b>G rate</b>	<b>2019</b>	<b>11</b>
	<b>J Rate</b>	<b>2020</b>	<b>10</b>
	<b>P rate</b>	<b>2020</b>	<b>10</b>
<b>MECO</b>	<b>Residntl</b>	<b>2017</b>	<b>13</b>
	<b>G rate</b>	<b>2015</b>	<b>15</b>
	<b>J Rate</b>	<b>2015</b>	<b>15</b>
	<b>P rate</b>	<b>2015</b>	<b>15</b>
<b>Molokai</b>	<b>Residntl</b>	<b>2016</b>	<b>14</b>
	<b>G rate</b>	<b>2011</b>	<b>19</b>
	<b>J Rate</b>	<b>2013</b>	<b>17</b>
	<b>P rate</b>	<b>2014</b>	<b>16</b>
<b>Lanai</b>	<b>Residntl</b>	<b>2017</b>	<b>13</b>
	<b>G rate</b>	<b>2013</b>	<b>17</b>
	<b>J Rate</b>	<b>2012</b>	<b>18</b>
	<b>P rate</b>	<b>2013</b>	<b>17</b>
<b>HELCO</b>	<b>Residntl</b>	<b>2015</b>	<b>15</b>
	<b>G rate</b>	<b>2012</b>	<b>18</b>
	<b>J Rate</b>	<b>2014</b>	<b>16</b>
	<b>P rate</b>	<b>2014</b>	<b>16</b>

Based on the following assumptions:

Hypothetical System Size/Cost/Production

System Size kW	Sun Hours	De-rate	First year Annual kWh	20 year total kWh
10	5.4	0.77	15,177	303,269
100	5.4	0.77	151,767	3,032,686
500	5.4	0.77	758,835	15,163,431
1000	5.4	0.77	1,517,670	30,326,863

"Business as usual" cost of energy was based on 2007 Average Electric Rates for the HECO website. This rate was escalated at 6.5% per year over the 20 life of the FiT contract. Business as usual does not include potential significant lumpy increases due to Decoupling, CEIS, i.e. underwater sea cable, smart grid, etc.....

All the systems are installed in January 1, 2010.

The projected kWh and the projected cents per KWH were multiplied to derive the \$ dollar value of the energy produce per year.

Transmission and distribution cost/changes are not considered factors since the Utility will recover these costs via

Based on the following assumptions:

Hypothetical System Size/Cost/Production

System Size kW	Sun Hours	De-rate	First year Annual kWh	20 year total kWh
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1000	5.4	0.77	1,517,670	30,326,863

"Business as usual" cost of energy was based on 2007 Average Electric Rates for the HECO website. This rate was escalated at 6.5% per year over the 20 life of the FiT contract. Business as usual does not include potential significant lumpy increases due to Decoupling, CEIS, i.e. underwater sea cable, smart grid, etc.....

All the systems are installed in January 1, 2010.

The projected kWh and the projected cents per KWH were multiplied to derive the \$ dollar value of the energy produce per year.

Transmission and distribution cost/changes are not considered factors since the Utility will recover these costs via the CEIS and Decoupling.

Thus, over the life of the 20 Year FIT agreements all the rate classes would experience a reduced cost of energy versus the utility business as usual cost of energy.<sup>5</sup>

***(iii) In order to have a successful FiT program, the HECO Companies must proactively focus on immediate and ongoing grid improvements:*** If structured and implemented corrected, a successful FiT program will make available many MWs of renewable energy to the HECO Companies' grid and help Hawaii move away from its dependence on fossil fuels pursuant to the Hawaii Clean Energy Agreement. However, in order to realize this goal of

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<sup>5</sup> Workpapers are available upon request.



moving away from Hawaii's dependence from fossil fuel the HECO Companies must be able to integrate all of the sustainable and locally produced renewable energy that will be made available to it and be able to deploy it to its customers.<sup>6</sup> If the HECO Companies cannot integrate all of the sustainable and locally produced renewable energy, it must improve its grid to be able to accommodate higher levels of renewable energy.

### ***3. Agreements reached during the Settlement Conference.***

The parties to the Docket, pursuant to the Commission's Order, met on March 18 and 19 for a Technical Conference and Settlement Discussions. During the Settlement discussions, the parties were able to reach the following agreement in regards to the term of the FiT contract:

*Pursuant to agreement reached during the March 18-19, 2009 technical conference and settlement discussions, the Parties agree that the standard term for a Schedule FIT Agreement should be 20 years for all eligible renewable resources provided that appropriate evidence is presented to support this length of term as consistent with the average expected life of each eligible resource.*

### ***4. Conclusion.***

Accordingly, with all due respect to the HECO Companies/Consumer Advocate's ("HECO/CA") proposed FiT, SA/HSEA believes that their proposal is incapable of aggressively encouraging development of renewable energy projects or meaningfully accelerating progress toward the state's clean energy goals, especially those articulated in the Energy Agreement.

In addition, based on the HECO/CA's position that the FiT would replace net energy metering going forward, SA/HSEA note that HECO/CA's proposed FiT may actually have the effect of discouraging small scale renewable energy development. Specifically, customers for whom it is not in their interest to enter the business of producing energy for sale will be worse

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<sup>6</sup> To date, despite numerous requests, the HECO Companies have not provided the parties to this proceeding or the Commission with detailed information about its grid and its system capacity.

off under the proposed FiT than with the current net metering program.

Therefore, SA/HSEA proposes that the Commission use the FiT proposal that it attached to its Opening Statement of Position as Appendix A along with the additions detailed in this Final Statement of Position.



Respectfully submitted.

DATED: Honolulu, Hawaii, *March 30,* 2009.

  
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RILEY SAITO

for The Solar Alliance

Respectfully submitted.

DATED: Honolulu, Hawaii, March 30, 2009

A handwritten signature in black ink, appearing to read "Mark Duda", is written over a horizontal line.

MARK DUDA

President, Hawaii Solar Energy Association



CERTIFICATE OF SERVICE

The foregoing Final Statement of Position was served on the date of filing by hand delivery or electronically transmitted to the following Parties:

CATHERINE P. AWAKUNI  
EXECUTIVE DIRECTOR  
DEPT OF COMMERCE & CONSUMER AFFAIRS  
DIVISION OF CONSUMER ADVOCACY  
P.O. Box 541  
Honolulu, Hawaii 96809

2 Copies  
Via Hand Delivery

DEAN MATSUURA  
MANAGER  
REGULATORY AFFAIRS  
HAWAIIAN ELECTRIC COMPANY, INC.  
P.O. Box 2750  
Honolulu, HI 96840-0001

Electronically transmitted

JAY IGNACIO  
PRESIDENT  
HAWAII ELECTRIC LIGHT COMPANY, INC.  
P. O. Box 1027  
Hilo, HI 96721-1027

Electronically transmitted

EDWARD L. REINHARDT  
PRESIDENT  
MAUI ELECTRIC COMPANY, LTD.  
P. O. Box 398  
Kahului, HI 96732

Electronically transmitted

THOMAS W. WILLIAMS, JR., ESQ.  
PETER Y. KIKUTA, ESQ.  
DAMON L. SCHMIDT, ESQ.  
GOODSILL, ANDERSON QUINN & STIFEL  
Alii Place, Suite 1800  
1099 Alakea Street  
Honolulu, Hawaii 96813

Electronically transmitted

ROD S. AOKI, ESQ.  
ALCANTAR & KAHL LLP  
120 Montgomery Street  
Suite 2200

Electronically transmitted

San Francisco, CA 94104

MARK J. BENNETT, ESQ.  
DEBORAH DAY EMERSON, ESQ.  
GREGG J. KINKLEY, ESQ.  
DEPARTMENT OF THE ATTORNEY GENERAL  
425 Queen Street  
Honolulu, Hawaii 96813  
Counsel for DBEDT

Electronically transmitted

CARRIE K.S. OKINAGA, ESQ.  
GORDON D. NELSON, ESQ.  
DEPARTMENT OF THE CORPORATION COUNSEL  
CITY AND COUNTY OF HONOLULU  
530 South King Street, Room 110  
Honolulu, Hawaii 96813

Electronically transmitted

LINCOLN S.T. ASHIDA, ESQ.  
WILLIAM V. BRILHANTE JR., ESQ.  
MICHAEL J. UDOVIC, ESQ.  
DEPARTMENT OF THE CORPORATION COUNSEL  
COUNTY OF HAWAII  
101 Aupuni Street, Suite 325  
Hilo, Hawaii 96720

Electronically transmitted

MR. HENRY Q CURTIS  
MS. KAT BRADY  
LIFE OF THE LAND  
76 North King Street, Suite 203  
Honolulu, Hawaii 96817

Electronically transmitted

MR. CARL FREEDMAN  
HAIKU DESIGN & ANALYSIS  
4234 Hana Highway  
Haiku, Hawaii 96708

Electronically transmitted

MR. WARREN S. BOLLMEIER II  
PRESIDENT  
HAWAII RENEWABLE ENERGY ALLIANCE  
46-040 Konane Place, #3816  
Kaneohe, Hawaii 96744

Electronically transmitted

DOUGLAS A. CODIGA, ESQ.  
SCHLACK ITO LOCKWOOD PIPER & ELKIND  
TOPA FINANCIAL CENTER  
745 Fort Street, Suite 1500

Electronically transmitted



Honolulu, Hawaii 96813  
Counsel for BLUE PLANET FOUNDATION

JOEL K. MATSUNAGA  
HAWAII BIOENERGY, LLC  
737 Bishop Street, Suite 1860  
Pacific Guardian Center, Mauka Tower  
Honolulu, Hawaii 96813

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KENT D. MORIHARA, ESQ.  
KRIS N. NAKAGAWA, ESQ.  
SANDRA L. WILHIDE, ESQ.  
MORIHARA LAU & FONG LLP  
841 Bishop Street, Suite 400  
Honolulu, Hawaii 96813  
Counsel for HAWAII BIOENERGY, LLC  
Counsel for MAUI LAND & PINEAPPLE COMPANY, INC.

Electronically transmitted

MR. THEODORE E. ROBERTS  
SEMPRA GENERATION  
101 Ash Street, HQ 12  
San Diego, California 92101

Electronically transmitted

MR. CLIFFORD SMITH  
MAUI LAND & PINEAPPLE COMPANY, INC.  
P.O. Box 187  
Kahului, Hawaii 96733

Electronically transmitted

MR. ERIK KVAM  
CHIEF EXECUTIVE OFFICER  
ZERO EMISSIONS LEASING LLC  
2800 Woodlawn Drive, Suite 131  
Honolulu, Hawaii 96822

Electronically transmitted

JOHN N. REI  
SOPOGY INC.  
2660 Waiwai Loop  
Honolulu, Hawaii 96819

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GERALD A. SUMIDA, ESQ.  
TIM LUI-KWAN, ESQ.  
NATHAN C. NELSON, ESQ.  
CARLSMITH BALL LLP  
ASB Tower, Suite 2200  
1001 Bishop Street

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Honolulu, Hawaii 96813  
Counsel for HAWAII HOLDINGS, LLC,  
dba FIRST WIND HAWAII

MR. CHRIS MENTZEL  
CHIEF EXECUTIVE OFFICER  
CLEAN ENERGY MAUI LLC  
619 Kupulau Drive  
Kihei, Hawaii 96753

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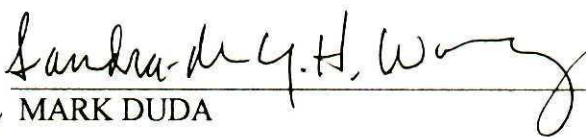
MR. HARLAN Y. KIMURA, ESQ.  
CENTRAL PACIFIC PLAZA  
220 South King Street, Suite 1660  
Honolulu, Hawaii 96813  
Counsel for TAWHIRI POWER LLC

Electronically transmitted

SANDRA-ANN Y.H. WONG, ESQ.  
ATTORNEY AT LAW, A LAW CORPORATION  
1050 Bishop Street, #514  
Honolulu, HI 96813  
Counsel for ALEXANDER & BALDWIN, INC.,  
Through its division, HAWAIIAN COMMERCIAL & SUGAR COMPANY

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DATED: Honolulu, Hawaii, March 30, 2009

  
for MARK DUDA  
President, Hawaii Solar Energy Association